PERSONAL COMPUTER—AS AN INTERFACE BETWEEN A TELEPHONE STATION SET AND A BUSINESS COMMUNICATION SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

The following U.S. applications, which are assigned to the same assignee as the instant application and filed concurrently therewith, have related subject matter:

(1) "Automated Message Chroniclng System", Ser. No. 842,601, filed Mar. 21, 1986 by J. W. Bourg.

(2) "Integrated Calling Directory", Ser. No. 842,682, filed Mar. 21, 1986 by J. W. Bourg and T. J. Tierney, Jr.

FIELD OF THE INVENTION

This invention is an interface arrangement which interconnects a business communication system with a telephone station set. This interface circuit is implemented by a personal computer which serves to control the operation of the associated telephone station set and provide business communication services.

BACKGROUND OF THE INVENTION

Stored program controlled telephone switching systems are used to interconnect telephone station sets as well as digital terminals, personal computers and large mainframe computers. The telephone switching system establishes data communication connections between computer facilities in a manner analogous to voice communication connections between subscribers using analog telephone station sets. Each of the computer facilities are connected to an associated communication pair of the telephone switching system by a modem. A standard telephone station set is also connected to the communication pair and is used to originate a call to a destination computer facility. As a result of the call origination, a communication connection is established through the telephone switching network from the originating telephone station set to the destination computer facility. The user then switches the modem on line and the modem converts the digital signals output by the computer facility to analog signals which are transmitted by the switching network to a modem associated with the destination computer facility. The destination modem converts the received analog signals to digital signals for use by the destination computer facility. Thus, the telephone station set is used for call origination purposes so that the computer at the originating location can be connected to the telephone lines.

An alternative arrangement is where the computer facility is directly connected to the communication pair through an interface circuit and the computer facility emulates the functions of the telephone station set. In this case, the originating computer usually displays the telephone station set buttons and key pad on the screen of the video display terminal (VDT) associated with the computer facility. The user can use the cursor on the VDT to select various telephone station set buttons displayed on the VDT so that the associated telephone function can be activated. The computer responds to the cursor movement by emulating the telphone station set function identified by the user. In this fashion, the digital telephone station set is no longer needed for call origination purposes. The computer facility can perform all the functions previously associated with the adjunct telephone station set.

Neither of these prior art arrangements provide communication services on the computer system for the associated telephone station set. The telephone and computer functions are independent and mutually exclusive.

SUMMARY OF THE INVENTION

The interface arrangement of the subject invention interconnects a business communication system with a telephone station set and provides communication services for the telephone station set on an associated personal computer. An interface board is plugged into an expansion slot on a personal computer and is also connected to any digital telephone station set as well as the communication leads from the business communication system. This interface board interposes the personal computer between the business communication system and the digital telephone station set. All signaling from the business communication system is received by the personal computer, interpreted, and appropriate control signals are then forwarded under control of the software resident on the personal computer to activate the digital telephone station set. The signals from the digital telephone station set are intercepted by the personal computer, interpreted, modified and appropriate control messages and signaling are then forwarded by the personal computer to the business communication system.

This arrangement enables a user to create software on the personal computer to control the operation of the telephone station set associated with the personal computer. The user can implement new features and services independent of the operation of the business communication system.

In addition, the interface board can be used in a standalone mode to function as a data module or a repeater in the case where the telephone station set is located a significant distance from the business communication system. The interface board replicates the received voice signals and transmits the new signals to the telephone station set.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** illustrates the subject business communication system and the various devices connected thereto in block diagram form;

FIG. **2** illustrates the interface apparatus of the subject invention in block diagram form;

FIG. **3** illustrates a detailed schematic diagram of the subject interface apparatus;

FIGS. **4** through **6** depict the details of the business communication system port circuit;

FIG. **7** illustrates the method of arranging FIGS. **4** through **6**;

FIG. **8** depicts the details of the DCP signaling protocol;

FIG. **9** depicts the details of the HDLC message frame; and

FIG. **10** depicts the three different modes of connectivity between the device driver, communication management application and the DCP interface card.

DETAILED DESCRIPTION

The business communication system of this invention is illustrated in FIG. **1**. This system includes a plurality of terminal equipment **T11–T58** each of which is associated with a respective one of port circuits **111–158**. This terminal equipment includes telephone station sets as